form the most trying portion of the observatory duties, and most grievously interfere with the astronomical department at the present time. Twenty districts, each averaging about seven talugs, are now made to send rain returns to the Observatory, and the arrangement of these, more especially the sifting and summing up of the registers of eight years past, will be no trifling additional task.

"The planet *Mars* was duly observed as proposed when in opposition, for the investigation of the Solar Parallax, both with the Equatoreal at rising and setting, and with the Transit Circle at meridian passage; but owing to pressure of other immediate duties, the observations have not yet been sufficiently reduced for submission to their respective head-quarters, viz., Greenwich and Pulkova.

"Some highly desirable longitude determinations are under contemplation throughout India, at no distant period, by means of the electric telegraph, and as a first step thereto, the construction of a chronograph has been sanctioned by the Local Government. A new Equatoreal of larger aperture and a superior Anemometer are expected to be supplied shortly. The present instruments are all in fair order, having been cleaned up and repaired by Mr. F. Doderet, the mathematical instrument maker to the Public Works Department, from which his services were transferred to the Observatory throughout the first half of the past year."

Madras, 1863, *Jan.* 26.

At a recent meeting of the Royal Society, our Fellow, Mr. Huggins, in conjunction with Dr. W. A. Miller, the Treasurer of that Society, communicated a Note on the "Lines in the Spectra of some of the Fixed Stars," as an earnest of the results of twelve months' observations of some 30 or 40 stars, the Moon, *Jupiter*, and *Mars*, which are to follow.

The valuable observations of Dr. Miller on the photographic spectra of the metals, &c., are too well known to require mention here, did not a recent deduction from them hold out great promise of doing for the *temperature* of the Sun and stars what the magnificent generalisation of Kirchoff has done for their *chemical constitution.* It has been shown that the spectra of metals vary with the temperature of the source of light, the higher the temperature the more refrangible being the vibrations. Thus, by introducing lime and sulphate of magnesia into the oxyhydrogen jet, the flame of which, according to Bunsen, cannot exceed 14580° Fahr., a spectrum has been obtained corresponding in length with that of the Sun; by employing the

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electric spark between magnesium terminals, however, a very decided band is obtained beyond the limits of the solar spectrum. Now, as magnesium is well known to exist in the Sun, it would thus appear that the temperature of that luminary is not so high as that of the electric spark, and that approximately it is not higher than that of the oxyhydrogen flame.

Next in importance to a form of apparatus which enables the lines to be clearly seen, must be reckoned the arrangement by which they are measured and referred to Fraunhofer's lines, the universally accepted standard of comparison. Mr. Huggins, having proved the exact coincidence of the sodium band with the solar line D on his apparatus (which is attached to his equatoreally-mounted 8-inch refractor), has employed it as the point from which all measures are taken, the sodium band being compared directly with the stellar spectrum under observation, both being in the field of view of the telescope. To guard against every source of error, however, in such delicate investigations, the spectra of one or two of the metals have also been compared with the stellar spectrum in some cases; and it is the intention of the authors of the Note to supplement their observations with these additional direct comparisons in each instance.

It may be mentioned that since this valuable communication was made to the Royal Society, Dr. Miller and Mr. Huggins have succeeded in obtaining microscopic photographs of the spectra of *Sirius* and *Capella*. Diagrams of the lines in *Sirius*, *α Orionis*, and *Aldebaran*, which had been observed and measured with great accuracy, accompanied the paper.

J. N. L.

An account, by Prof. Secchi, of his latest observations on the same subject, together with a sketch of the Spectra of *α Orionis*, *Aldebaran*, *Sirius*, *Rigel*, and *Pollux*, will be found, *Ast. Nach.*, No. 1405.—Ed.

A communication has been received from M. de Gasparis, "*Sur une Equation pour le Calcul des Orbites Planetaires.*" This has already been published in the *Ast. Nach.*, No. 1405, and in the *Comptes Rendus* of the Academy of Paris.

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